Eddy Current Separators

Operating Principles

Eddy Current Separators (ECS) are designed to separate non-ferrous conducting metals.

The Eddy Current system consists of a short belt conveyor. The ECS rotor, which is fitted at the discharge end of the conveyor, is constructed using a high-intensity rare earth (neodymium iron-boron) magnet system and sits inside a non-metallic rotor cover. The rotor, when spinning at high speeds, induces an electric current into conducting metals. This induced electric current produces a magnetic field, which opposes that of the rotor, repelling non-ferrous metals. The remaining materials free-fall over the rotor, separating them from the repelled materials.

Applications

Eddy Current Separators are increasingly used wherever separation of non-ferrous metals from a product stream can give a more valuable end product. Whether the end use is in recycling, waste reduction, raw material production and any other process where separation would prove beneficial.

Typical examples of applications are:

- Separation of non-ferrous metals in auto shredder residue.
- Separation of non-ferrous metals from solid waste incinerator ash.
- Sorting of steel and aluminium beverage cans.
- Removal of contamination from crushed glass cullet.
- Removal of non-ferrous metals from shredded wood.
- Separation of non-ferrous dross from foundry sand.
- Non-ferrous metal removal in WEEE recycling plants.
- Separation of non-ferrous metals from various Recycling Facilities.

Common Design Features

All of the **KW Supply** ECS units are built to combine the highest separating ability with a long and trouble-free operating life. **KW Supply** ECS units are all manufactured using a concentric rotor design to allow for maximum separation over the entire outer drum face. This ensures that particles, which may be released through material free fall can also be separated, making it more efficient than the eccentric design.
The rotors used on the **KW Supply** range of ECS units are all dynamically balanced at 3600 RPM to ensure a trouble free operating life, even at the highest operating speeds.

Abrasion resistant PVC belts are used on the ECS units and to further improve the separation capabilities of the Eddy Current, they are specially designed to be very thin, minimising the gap between the product and the rotor. The epoxy resin cover, which protects the rotors magnet system is also specially designed to be as thin as possible, whilst still giving the required strength. The cover has a blue outer layer and a clear under layer which, acts as a wear indicator.
To increase the performance of our ECS units and enable optimum separation, **KW Supply** offer optional vibratory feeders for spreading the material evenly across the ECS belt conveyor and producing what is known as a ‘mono-layer’.

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Eddy Current Separators

High Intensity ECS Units

The High Intensity ECS units are specifically designed for the separation of small and difficult particles, which require high repulsive forces. High Intensity Units can be manufactured to operate on belt widths up to 1500mm enabling them to handle very large throughputs.

The technical features that are specific to the High Intensity ECS are:

- *300mm diameter rotor* - The **KW Supply** standard ECS units are manufactured with a 300mm diameter rotor with 24 poles of the highest grade neodymium iron-boron magnets. This provides a very high strength magnetic field for optimum repulsion.
- *24 pole rotor* - To allow for the separation of fine non-ferrous particles, The High Intensity Eddy Current Separators are fitted with 24 pole rotors.
- *Variable rotor and belt speeds* - The High Intensity ECS has variable rotor and belt speed features to allow customers to tailor their units in order to achieve specific separation requirements.
- *Belt change jacks* - Belt changes can be a time consuming and physically difficult task to carry out. In order to make belt changes much easier, High Intensity ECS units can be fitted with a hydraulic jacking system. To further assist clients during belt changes, the units have also been designed with hinged frames.

ECS 'R' Type

Many ECS applications involve high throughput rates that can only be handled by the large High intensity units due to their belt widths. If however, applications do not require the separation capabilities of the larger and higher specification units, then purchasing a machine of this type for its belt width alone, would not be cost effective.
To eliminate this problem, **KW Supply** has designed the ECS 'R' Type. The new 'R' Type fits into the **KW Supply** ECS range between the Can Sorter and the High Intensity ECS units, incorporating features of both machines.

Specific features of the 'R' Type ECS include:

- *High throughput capabilities* - The 'R' Type has a rotor diameter of 190mm and can be manufactured to fit belt widths of up to 1250mm.
- *Variable rotor control* - The 'R' Type ECS has variable rotor controls to allow customers to set the rotor at the correct speed needed to meet their specific separation requirements.
- *12 pole rotor* - A 12 pole rotor is used on the ECS 'R' Type. The 12-pole rotor is capable of achieving a better separation than the 6 pole rotor used on the Can Sorter.

The Can Sorter

The Can Sorter is specifically designed for the separation of non-ferrous beverage cans from dry recyclable applications. The Can Sorter ECS is a low-cost alternative to larger Eddy Current units when applications do not require higher specification machines.

Technical features that are specific to the Can Sorter units are:

- *Simplistic and cost effective design* - The Can Sorter has a 122mm diameter, 6-pole rotor and is available with an effective width of up to 600mm. The Can Sorter was designed to be a more compact and simplistic unit than the larger machines in the range, whilst still providing efficient separation of aluminium cans.
- *Pre-set belt and rotor Speeds* - The belt and rotor speeds, which are usually variable on standard ECS units, are pre-set on the Can Sorter models to give optimum can separation.

Eddy Current Separators

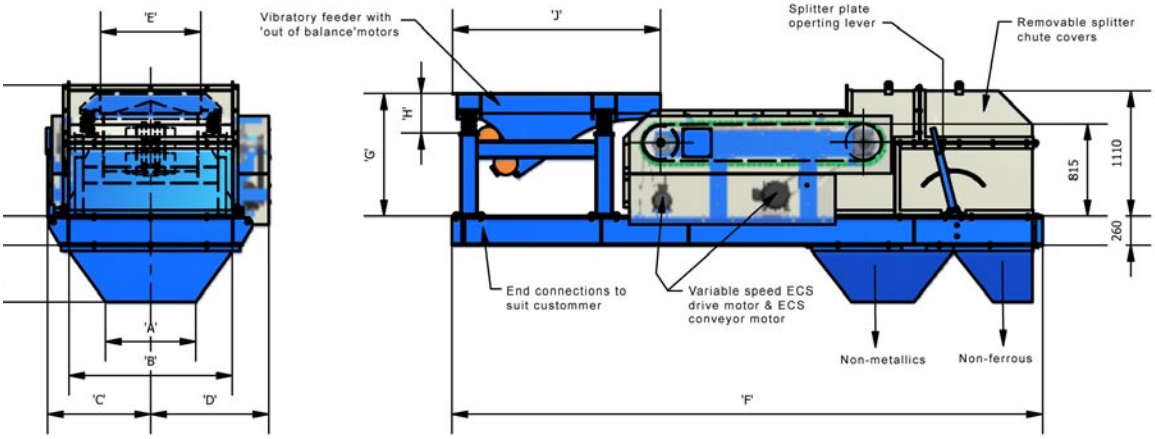
Optional Extras

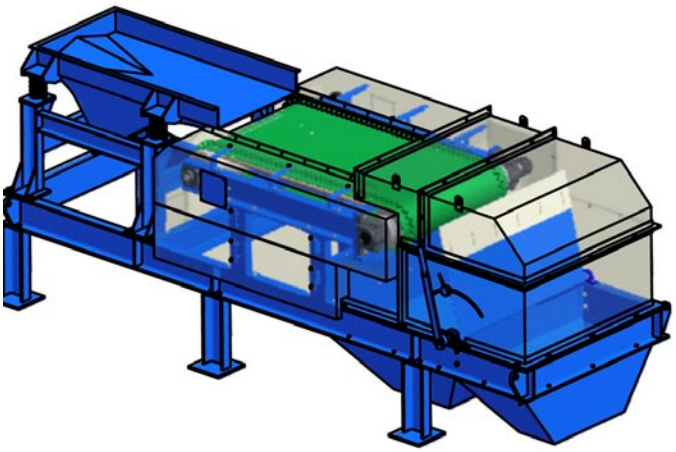
Ferrous materials can sometimes get caught between the rotor and the belt, causing substantial damage to the rotor cover. The key to avoiding this type of damage is to remove the fine ferrous particles, which may be present in the product stream.

KW Supply can supply complete 'turn key' plants to meet specific customer requirements. The plants can include in-feed conveyors, diverter chutes and additional magnetic separation equipment such as Overband Separators.

KW Supply is able to provide supports to ground level should they be required. Custom designed walkways can also be provided for around the ECS unit to allow for greater access to the machine and its components.

Rotary or static cleaning brushes can be installed to remove material, which may get stuck to the Eddy Current Separators' conveyor. **KW Supply** would advise customers to have this option if their product is particularly wet.





SEPARATOR					
	ECS 50	ECS 75	ECS 100	ECS 125	ECS 150
'A'	300	550	800	1050	1300
'B'	950	1200	1450	1700	1950
'C'	665	790	915	1040	1165
'D'	800	925	1050	1175	1300
'E'	400	650	900	1150	1400
'F'	4560	4670	5240	5570	5900
'G'	1020	1045	1345	1345	1345
'H'	315	447	450	470	690
'J'	1000	1250	1500	2000	2500
ROTOR	5.5kW	5.5kW	7.5kW	7.5kW	11.0kW

All dimensions are in millimeters.
All dimensions are approximate and are subject to confirmation at the time of order.

KW Supply has a wide experience in providing innovative magnetic solutions.

The **KW Supply** systems are known for their high performance and reliable operations.

Please visit our website at: www.kwsupply.com